

Eyelash Seaweed

Dione arcuata

Primitive puzzle



Eyelash seaweed habitat. NIWA

Quickfacts

A recently discovered primitive seaweed

Only known from four boulders on the Kaikoura coast

A puzzle why it's not found further afield

Feared to have become extinct following the seabed being lifted from the sea in the 2016 Kaikoura earthquake

The eyelash seaweed

In 2000, a research project on New Zealand seaweeds in the Order Bangiales by scientists from the National Institute of Water and Atmosphere (NIWA), Te Papa and the University of Otago discovered over three dozen potentially new species. One of these is the eyelash seaweed, which was discovered on inter-tidal boulders at the mouths of the Rakautara and Ohau Streams, north of Kaikoura. Further searches along the Kaikoura coast failed to find other sites where the eyelash seaweed occurs, despite similar-looking habitat at these sites. Currently scientists have no idea why eyelash seaweed only occurs at these two sites.

The eyelash seaweed is a curved, thread-like marine red alga the length and thickness of a human eyelash. It is most frequently found on the shaded sides of boulders which are exposed during extreme low tides. It is related to the other marine red algae (Rhodophyta) in the Order Bangiales, which also includes *Porphyra* and *Pyropia* seaweeds (known in New Zealand as karengo and in Japan as nori) and *Bangia* which forms reddish slippery mats on rocks. The





Bangiales are some of the oldest lifeforms – a 1.2 billion year old fossil is known. The relationships of Bangiales species are complex: they are known to include some cryptic species (species that differ genetically from look-alike species), and possibly species known by different names in different countries, or different species known by the same name in different countries. Despite this complexity, the eyelash seaweed is distinctive enough for it to be classified in a new genus *Dione*.

Little is known about the ecology of the eyelash seaweed. It has a two-part life cycle in which the inconspicuous fuzzy conchocelis stage grows in cavities of shells or rocks and, when the water temperature or day length is right, produces spores which drift in sea currents and grow into the 1.5 cm long visible eyelash-like thallus stage in summer. Both of these stages can also reproduce asexually by forming microscopic spores. The eyelash seaweed can produce a number of different types of spores – a strategy that allows it to cope with its storm-lashed habitat. Its habitat requirements are unknown, as are its grazers and interactions with other seaweeds and rock-encrusting marine life.

Eyelash seaweed conservation

The conservation status of New Zealand's seaweeds has not yet been assessed, and the distribution and abundance of many seaweeds are poorly known (45% of seaweeds are represented in museum collections by 5 or fewer specimens). While there is still much to learn about the eyelash seaweed, it appears to be restricted to a very small area of the Kaikoura coast, as it has not been found in searches of many other sites around New Zealand. However, the eyelash seaweed is only visible in summer on rocks exposed during extreme low tides (for the rest of the year it is present as the hidden conchocelis stage) and therefore we know little of its habitats, population size, or distribution. The marine environment where the eyelash seaweed is found is largely unknown, but is relatively safe from most of the usual threats such as coastal subdivision, pollution, flood sediments, and erosion. Eyelash seaweed can be grown in a laboratory.

The 2016 Kaikoura earthquake lifted the area of seabed inhabited by the eyelash seaweed above sea level, and it is feared that this may have caused the extinction of this species.

What next for eyelash seaweed?

The threats to the survival of the eyelash seaweed are:

1. The lack of information on the species.
2. Only being found at two sites 4 kilometres apart.
3. The impact of the 2016 Kaikoura earthquake.
3. Changes in the marine environment.

Successfully protecting eyelash seaweed from these threats must be achieved in order for a conservation programme to succeed. Ideally, this should be done by:

1. Searching for new populations.

Currently the eyelash seaweed is known from only two sites along the Kaikoura coast that are 4km apart. Both of these sites were raised above the sea during the recent 2016 Kaikoura earthquake. Searching for new populations in the surrounding area is the only meaningful action that can be taken for this species, at this time.

Using experts to lead a team to search for new populations is likely to cost \$16,000 to \$25,000 (this includes training local people in the identification of eyelash seaweed).

More information

Website: algaeBASE. [Link](#)

Website: New Zealand Plant Conservation Network. [Link](#)

Book: New Zealand seaweeds: an illustrated guide. By Wendy Nelson. Te Papa Press, Wellington, 2013.

News article: Seaweed secrets reveal a biodiversity hotspot. National Institute of Water and Atmosphere, 1 June 2007. [Link](#)

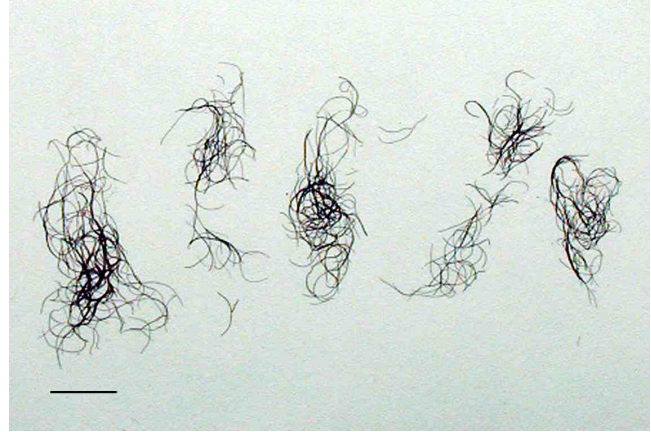
Scientific paper: *Dione* and *Minerva*, two new genera from New Zealand circumscribed for basal taxa in the Bangiales (Rhodophyta). By Wendy A. Nelson, Tracy J. Farr & Judy E.S. Broom. *Phycologia* Vol. 44, pages 139-145, 2005.



Photos



Magnified strand of eyelash seaweed. NIWA



Dried specimen of eyelash seaweed. NIWA

This webpage represents the views of the Endangered Species Foundation of New Zealand and not necessarily those of other individuals or organisations involved in the conservation of this species.

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